

Ozone (ground level)

Human Health Risk	H
Ecological Risk	L
Socioeconomic Risk	M

Ozone is one of a class of compounds called photochemical oxidants that result from chemical reactions between various nitrogen oxides (NO_x) and volatile organic compounds (VOCs) in the presence of sunlight. Stationary sources and motor vehicles are the primary source of NO_x and VOCs. Inhalation of ground level ozone has been associated with a variety of respiratory problems, especially asthma, but also including acute and chronic bronchitis, chronic obstructive pulmonary disease (COPD), reduced lung function, and premature death. Ozone is also linked to various types of damage to agricultural crops, domestic plants, forests, and other plant life.

What's at risk?

All residents statewide are potentially exposed during the summer months. Children may be at increased risk of exposure because they are active outside during the summer, when ozone levels are at their highest. Adults and children with respiratory illnesses, such as asthma, bronchitis and emphysema, and adults who are active outdoors during the summer are also at higher risk. Ecosystems at risk include agricultural areas and urban vegetation, which are exposed to somewhat higher levels of ozone.

What are the human health impacts in New Jersey?

Studies on ozone exposure suggest that there is no minimum threshold for triggering respiratory responses and a significant proportion of hospital visits for asthma can be associated with exposure to elevated ozone levels. Federal health-based standards for ozone are set at 80 ppb measured over an 8-hour period, and 120 ppb for a 1-hour period. In 1999, one or more locations in New Jersey were in violation of the 8-hour standard on 46 days, and the 1-hour standard on 10 days. On an average day in 1999, peak 1-hour concentrations were in the range of 50-65 ppb. In New Jersey, there are more than 440,000 asthmatics and 430,000 persons with chronic bronchitis, who may be adversely affected by ozone levels.

What are the ecological impacts of ground level ozone in New Jersey?

Exposure to ground level ozone can suppress the

growth of crops, trees, shrubs, and other vegetation, and increase susceptibility to insects and diseases. Agricultural crops are considered to be at increased risk, because of the economic impacts associated with reduced growth. New Jersey ozone levels are unlikely to have a visible impact on forest ecosystems, although ozone exposure may negatively affect individual tree species, such as the eastern white pine and black cherry, as well as urban vegetation.

What are the socioeconomic impacts of ground-level ozone in New Jersey?

Ground level ozone has been linked to a variety of respiratory problems, and agricultural crop and other plant damage. Socioeconomic impacts include costs associated with that damage, as well as worry due to respiratory illness, and reduced visibility on high-smog days. Minimum cost estimates of ground level ozone's contribution to respiratory illness total more than the \$59 million, and crop damage to corn, winter wheat, and soybean crops are estimated at \$1 million to \$2 million.

What's being done?

During the 1980s, the 1-hour ozone standard was exceeded in New Jersey more than 30 times per year. In recent years, the standard is exceeded much less often—less than 20 times per year. This overall reduction in ozone levels can be attributed to reductions in allowable emissions from automobiles and industrial sources, and by controlling releases at fuel pumps.